IN THE CLAIMS

Please delete all claims and substitute therefor the following claims.

--108. A pharmaceutical composition, comprising

a nucleic acid which comprises at least one oligonucleotide (oligo) effective to alleviate hyper-responsiveness to, and/or increased levels of, adenosine, bronchoconstriction, allergy(ies) and/or inflammation, and contains up to and including about 15% adenosine (A), the oligo being

anti-sense to the initiation codon, the coding region or the 5' or 3' intron-exon junctions of a gene encoding an adenosine A1, A2a, A2b or A3 receptor or anti-sense to their respective mRNA;

combinations of the oligos;

pharmaceutically and veterinarily acceptable salts of the oligos and their combinations; and

mixtures of the nucleic acids; and

a surfactant that either counters low levels of natural surfactant or enhances the uptake of the oligo(s) throughout he lung; wherein the surfactant may be operatively linked to the nucleic acid.

109. The composition of claim 108, wherein the oligo consists of up to about 10% A.

110. The composition of claim 109, wherein the oligo consists of up to about 5% A.

111. The composition of claim 110, wherein the oligo consists of up to about 3% A.

112. The composition of claim 111, wherein the oligo is A-free.

113. The composition of claim 108, wherein the oligo is anti-sense to the initiation codon of the mRNA, to the 5' or 3' intron-exon junctions or to sequences of the coding region comprising 2 or more G and/or C of the adenosine A1 receptor gene.

114. The composition of claim 108, wherein the oligo is anti-sense to the initiation codon of the mRNA, to the 5' or 3' intron-exon junctions or to sequences of the coding region comprising 2 or more G and/or C of the adenosine A_{2a}, A_{2b} and/or A_3 receptors.

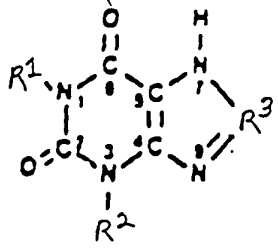
115. The composition of claim 108, wherein if the oligo contains adenosine (A), at least one A is substituted by a universal base selected from the group consisting of heteroaromatic bases which bind to a thymidine base but have antagonist activity and less than about 0.3 of the adenosine base agonist activity at the adenosine A_1, A_{2b} and A_3 receptors, and heteroaromatic bases which have no activity or have an agonist activity at the adenosine A_{2a} receptor.

116. The composition of claim 115, wherein all As are substituted by universal bases selected from the group consisting of heteroaromatic bases which bind to a thymidine base but have antagonist activity and less than about 0.3 of the adenosine base agonist activity at the adenosine A_1, A_{2b} and A_3 receptors, and heteroaromatic bases which have no activity or have an agonist activity at the adenosine A_{2a} receptor.

117. The composition of claim 115, wherein the heteroaromatic bases are selected from the group consisting of pyrimidines and purines, which may be substituted by O, halo, NH_2, SH, SO, SO_2, SO_3, COOH and branched and fused primary and secondary amino, alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, alkoxy, alkenoxy, acyl, cycloacyl, arylacyl, alkynoxy, cycloalkoxy, aroyl, arylthio, arylsulfoxyl, halocycloalkyl, alkylcycloalkyl, alkenylcycloalkyl, alkynylcycloalkyl, haloaryl, alkylaryl, alkenylaryl, alkynylaryl, arylalkyl, arylalkenyl, arylalkynyl, arylcycloalkyl, which may be further substituted by O, halo, NH_2, primary, secondary and tertiary amine, SH, SO, SO_2, SO_3, cycloalkyl, heterocycloalkyl and heteroaryl.

118. The composition of claim 117, wherein the pyrimidines are substituted at a 1, 2, 3, and/or 4 position, and the purines are substituted at a 1, 2, 3, 4, 7 and/or 8 position.

119. The composition of claim 118, wherein the pyrimidines and purines are selected from the group consisting of theophylline, caffeine, dyphylline, etophylline, acephylline piperazine, bamifylline, enprofylline and xantine having the chemical formula



wherein R^1 and R^2 are independently H, alkyl, alkenyl or alkynyl and R^3 is H, aryl, dicycloalkyl, dicycloalkenyl, dicycloalkynyl, cycloalkyl, cycloalkenyl, cycloalkynyl, O-cycloalkyl, O-cycloalkenyl, O-cycloalkynyl, NH_2-alkylamino-ketoxyalkyloxy-aryl and mono and dialkylaminoalkyl-N-alkylamino-SO_2 aryl.

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120. The composition of claim 119, wherein the universal base is selected from the group consisting of 3-nitropyrrole-2'-deoxynucleoside, 5-nitro-indole, 2-deoxyribosyl-(5-nitroindole), 2-deoxyribofuranosyl-(5-nitroindole), 2'-deoxyinosine, 2'-deoxynebularine, 6H, 8H-3,4-dihydropyrimido [4,5-c] oxazine-7-one or 2-amino-6-methoxyaminopurine.

121. The composition of claim 108, wherein a methylated cytosine (^{m}C) is substituted for an unmethylated cytosine (C) in at least one CpG dinucleotide if present in the nucleic acid(s).

122. The composition of claim 108, wherein at least one mononucleotide is linked or modified by one or more of phosphorothioate, phosphorodithioate, phosphorotrithioate, methylphosphonate, phosphoramidate, boranophosphate, phosphotriester, formacetal, 2'-O-methyl, thioformacetal, 5'-thioether, carbonate, 5'-N-carbamate, sulfate, sulfonate, sulfamate, sulfonamide, sulfone, sulfite, sulfoxide, sulfide, hydroxylamine, methylene (methylimino) (MMI) and methyleneoxy (methylimino) (MOMI), terminal 1,3-propanediol, terminal dodecanol, 2'-O-methoxyethyl, C-5-propynyl pyrimidine, C-5 methyl cytidine, C-5 ethynyl pyrimidine, 2'-propoxy, C-18 amine, N3'-P5' phosphoramidates, 3'-alkylamino, 2'-fluoro; 5-fluoro pyrimidine, 5-iodo pyrimidine, 5-bromo pyrimidine, 2'-borano, C-5 hexynyl pyrimidine, 2'-O-(2-methoxy)ethyl, 2'-O-aminopropyl, 5-(phenylethyl) or peptide nucleic acid interbase linkages or conjugated to a polyethylene glycol, cholesterol, cholesteryl, dehydroepiandrosterone (DHEA), dehydroepiandrosterone sulfate (DHEASulfate), dehydroepiandrosterone sulfatide (DHEA Sulfatide), ubiquinone (CoQn), dolichol, poly L-lysine, sulfatidic acid or fatty acids.

B2 Cont.

123. The composition of claim 122, wherein all mononucleotides are linked or modified by one or more of phosphorothioate, phosphorodithioate, phosphorotrithioate, methylphosphonate, phosphoramidate, boranophosphate, phosphotriester, formacetal, 2'-

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O-methyl, thioformacetal, 5'-thioether, carbonate, 5'-N-carbamate, sulfate, sulfonate, sulfamate, sulfonamide, sulfone, sulfite, sulfoxide, sulfide, hydroxylamine, methylene (methylimino) (MMI) and methyleneoxy (methylimino) (MOMI), terminal 1,3-propanediol, terminal dodecanol, 2'-O-methoxyethyl, C-5-propynyl pyrimidine, C-5 methyl cytidine, C-5 ethynyl pyrimidine, 2'-propoxy, C-18 amine, N3'-P5' phosphoramidates, 3'-alkylamino, 2'-fluoro; 5-fluoro pyrimidine, 5-iodo pyrimidine, 5-bromo pyrimidine, 2'-borano, C-5 hexynyl pyrimidine, 2'-O-(2-methoxy)ethyl, 2'-O-aminopropyl, 5-(phenylethyl) or peptide nucleic acid interbase linkages or conjugated to a polyethylene glycol, cholesterol, cholesteryl, dehydroepiandrosterone (DHEA), dehydroepiandrosterone sulfate (DHEASulfate), dehydroepiandrosterone sulfatide (DHEA Sulfatide), ubiquinone (CoQn), dolichol, poly L-lysine, sulfatidic acid or fatty acids.

124. The composition of claim 108, wherein the anti-sense oligo comprises about 7 to 60 mononucleotides.

125. The composition of claim 108, wherein the oligo comprises a sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 and SEQ ID NO:7 to SEQ. ID NO:1035.

126. The composition of claim 108, wherein the nucleic acid is linked to an agent that enhances cell internalization or up take and/or a cell targeting agent.

127. The composition of claim 126, wherein the cell internalization or up take enhancing agent is a transferrin, a asialoglycoprotein or a streptavidin.

128. The composition of claim 126, wherein the cell targeting agent comprises a vector, and the nucleic acid is operatively linked to the vector.

129. The composition of claim 128, wherein the vector is a prokaryotic or eukaryotic vector.

130. The composition of claim 108, wherein the surfactant is selected from the group consisting of surfactant protein A, surfactant protein B, surfactant protein C, surfactant protein D and surfactant protein and active fragments thereof, non-dipalmitoyl disaturated phosphatidylcholine, dipalmitoylphosphatidylcholine, phosphatidylcholine, phosphatidylglycerol, phosphatidylinositol, phosphatidylethanolamine, phosphatidylserine, phosphatidic acid, ubiquinones, lysophosphatidylethanolamine,

lysophosphatidylcholine, palmitoyl-lysophosphatidylcholin, dehydroepiandrosterone, dolichols, sulfatidic acid, glycerol-3-phosphate, dihydroxyacetone phosphate, glycerol, glycero-3-phosphocholine, dihydroxyacetone, palmitate, cytidine diphosphate (CDP) diacylglycerol, CDP choline, choline, choline phosphate, lamellar bodies, omega-3 fatty acids, polyenic acid, polyenoic acid, lecithin, palmitic acid, non-ionic ethylene and/or propylene oxide block copolymers, polyoxypropylene, polyoxyethylene, poly (vinyl amine) with dextran and/or alkanoyl side chains, polyoxy ethylene ethers, phenoxy polyethoxy alcohols, phosphatidyl choline esters and phosphatidyl ethers, palmitates, alcohols and tyloxapol, phospholipids, neutral lipids, fatty acids and surfactant-associated proteins, and $C_{22}H_{19}C_{10}$.

131. The composition of claim 130, wherein the the surfactant is selected from the group consisting of polyoxy ethylene 23 lauryl ether (Brij 35®), t-octyl phenoxy polyethoxy ethanol (Triton X-100®), dipalmitoyl phosphatidyl choline (DPPC) and phosphatidyl glycerol (PG) (ALEC®), colfoceryl-cetyl alcohol-tyloxapol or colfosceril palmitate, cetyl alcohol and tyloxapol (Exosurf®), phospholipids, neutral lipids, fatty acids and surfactant-associated proteins (Survanta®) and $C_{22}H_{19}C_{10}$ (Atovaquone®).

131. The composition of claim 108, which comprises particles of about 0.05 to about 50 μm in size of the nucleic acid.

132. The composition of claim 108, further comprising a carrier.

133. The composition of claim 132, wherein the carrier comprises a biologically acceptable carrier.

134. The composition of claim 108, wherein the carrier is a pharmaceutically or veterinarily acceptable carrier.

135. The composition of claim 134, wherein the carrier is selected from the group consisting of gaseous, liquid and solid carriers and mixtures thereof.

136. The composition of claim 134, further comprising an agent selected from the group consisting of therapeutic agents other than the oligos, antioxidants, flavoring and coloring agents, fillers, volatile oils, buffering agents, dispersants, RNA inactivating agents, flavoring agents, propellants and preservatives.

137. The composition of claim 136, comprising

a pharmaceutically or veterinarily acceptable carrier, and

a nucleic acid,

a surfactant, and

a therapeutic agent selected from the group consisting of adenosine A_1, A_{2b} and A_3 receptor activity inhibiting agents other than the oligo(s), anti-arrhythmic agents, anti-inflammatory agents, anti-bacterial agents, anti-sepsis agents, adenosine and agents exhibiting adenosine agonist activity, analgesics, diuretics, kidney activity maintenance and restoration agents and agents for the treatment of pulmonary vasoconstriction, inflammation, allergies, asthma, acute respiratory distress syndrome (ARDS), ischemia, impeded and blocked respiration, respiratory distress syndrome (RDS), pain, cystic fibrosis, pulmonary hypertension, pulmonary vasoconstriction, emphysema, chronic obstructive pulmonary disease (COPD), cancers selected from the group consisting of melanoma, hepatocellular carcinoma, leukemias, lymphomas and carcinomas of the colon, breast, lung, pancreas, kidney, hepatic, lung, breast and prostate cancer, and metastatic cancers, and to combat side effects produced by radiation agents, chemotherapeutic agents, antibody therapy agents and phototherapeutic agents.

138. The composition of claim 136, wherein the RNA inactivating agent comprises an enzyme.

139. The composition of claim 138, wherein the enzyme comprises a ribozyme.

140 The composition of claim 108, further comprising a propellant.

141. The composition of claim 108, wherein the nucleic acid is present in an amount of about 0.01 to about 99.99 w/w of the composition.

142. The composition of claim 132, in the form of a systemic or topical formulation.

143. The formulation of claim 142, selected from the group consisting of intrabuccal, intrapulmonary, intratumor, nasal, intravascular, inhalable, transdermal, intracavitary, implantable, iontophoretic, intraorgan, implantable, slow release and enteric coating formulations.

144. The formulation of claim 143, wherein the carrier is selected from the group consisting of gaseous, solid and liquid carriers.

145. The formulation of claim 144, wherein the liquid carrier is selected from

the group consisting of solutions, suspensions, and oil-in-water and water-in-oil emulsions.

146. The formulation of claim 144, which is selected from the group consisting of a powder, capsules, sprays, aerosols, solutions, suspensions and emulsions.

147. The formulation of claim 143, which is a topical formulation, wherein the carrier is selected from the group consisting of creams, gels, ointments, sprays, aerosols, patches, solutions, suspensions and emulsions.

148. The formulation of claim 143, wherein the carrier is selected from the group consisting of aqueous and alcoholic solutions and suspensions, oily solutions and suspensions and oil-in-water and water-in-oil emulsions.

149. The formulation of claim 148, which is a transdermal formulation.

150. The formulation of claim 148, which is an iontophoretic transdermal formulation, wherein the carrier is selected from the group consisting of aqueous and alcoholic solutions, oily solutions and suspensions and oil-in-water and water-in-oil emulsions, and wherein the formulation further comprises a transdermal transport promoting agent.

151. An implantable capsule or cartridge, comprising the formulation of claim 143.

152. The formulation of claim 142, wherein the carrier is selected from the group consisting of aqueous and alcoholic solutions and suspensions, oily solutions and suspensions and oil-in-water and water-in-oil emulsions.

153. The formulation of claim 142, wherein the carrier comprises a hydrophobic carrier.

154. The formulation of claim 153, wherein the carrier comprises lipid vesicles and/or particles.

155. The formulation of claim 154, wherein the vesicles comprise liposomes and the particles comprise microcrystals.

156. The formulation of claim 155, wherein the vesicles comprise liposomes which comprise the mucleic acid.

157. The formulation of claim 144, comprising a respirable, intrapulmonary, intracavitary, nasal or inhalable formulation.

158. The formulation of claim 157, which is an intrapulmonary formulation.

159. The formulation of claim 157, which is a nasal formulation.

160. The formulation of claim 157, which is an intracavitary formulation.

161. The formulation of claim 143, in single or multiple unit dose form.

162. The formulation of claim 143, in bulk.

163. A cell, comprising the nucleic acid of claim 108.

164. A kit for treatment of diseases and conditions associated with hypersensitivity to and/or increased levels of, adenosine and/or bronchoconstriction and/or allergy(ies) and/or inflammation, comprising

a delivery device;

the composition of claim 108; and

instructions for its use;

and optionally an agent selected from the group consisting of therapeutic and diagnostic agents other than the oligo, anti-oxidants, fillers, volatile oils, dispersants, anti-oxidants, flavoring agents, propellants, preservatives, buffering agents, RNA inactivating agents, cell-internalized and up-taken agents and coloring agents.

165. The kit of claim 164, wherein the delivery device comprises a nebulizer which delivers single metered doses of the formulation.

166. The kit of claim 165, wherein

the nebulizer comprises an insufflator; and

the composition is provided in a piercable or openable capsule or cartridge.

167. The kit of claim 165, wherein

the delivery device comprises a pressurized inhaler; and

the composition comprises a suspension, solution or dry formulation of the agent.

168. The kit of claim 167, comprising a surfactant, a nucleic acid and a therapeutic agent selected from the group consisting of anti-adenosine A_1, A_{2b} and A_3 receptor antagonists other than the oligo(s), adenosine A_{2a} receptor stimulants, anti-inflammatory agents, anti-histaminic agents, anti-allergic agents, anti-bacterial, anti-vials, analgesics, kidney activity maintenance and restoration agents, anti-cancer agents, adenosine, blood pressure controlling agents, and diuretics.

169. The kit of claim 167, wherein the solvent is selected from the group

consisting of organic solvents and organic solvents mixed with one or more co-solvents.

170. The kit of claim 164, wherein the composition is provided in a capsule or carridge.

171. The kit of claim 163, further comprising a propellant and means for delivery thereof; and instructions for preparation and delivery of a composition comprising particles of about 0.05 to about 50 μm in size of the nucleic acid with the propellant means.

172. The kit of claim 167, further comprising

a propellant,

means for delivery thereof, and

instructions for preparation and delivery of a composition comprising particles of about 0.05 to about 50 μm in size of the nucleic acid with the propellant means.

173. An in vivo method of delivering a pharmaceutical composition to a target polynucleotide, comprising administering to the airways of a subject an aerosol composition comprising a nucleic acid which comprises least one oligonucleotide (oligo) effective to alleviate hyper-responsiveness to, and/or increased levels of, adenosine, bronchoconstriction, allergy(ies) and/or inflammation, and contains up to and including about 15% adenosine (A), the oligo being anti-sense to the initiation codon, the coding region or the 5' or 3' intron-exon junctions of a gene encoding a protein associated with hyper-responsiveness to, and/or increased levels of, adenosine, bronchoconstriction, allergy(ies) and/or inflammation, or anti-sense to the respective mRNA; combinations comprising more than one oligo; pharmaceutically and veterinarily acceptable salts of the nucleic acid(s) and mixtures of the nucleic acids, their combinations and their salts.

174. The method of claim 173, wherein the hyper-responsiveness to and/or increased levels of adenosine, bronchoconstriction, allergy(ies) and/or inflammation of the lung is (are) associated with a disease or condition.

175. The method of claim 174, wherein the disease or condition is selected from the group consisting of one or more of sepsis, pulmonary vasoconstriction, inflammation, allergies, asthma, impeded respiration, respiratory distress syndrome, acute respiratory distress syndrome (ARDS), renal damage or failure, ischemia, pain, cystic fibrosis, pulmonary hypertension, pulmonary vasoconstriction, emphysema,

chronic obstructive pulmonary disease (COPD), and cancers selected from the group consisting of leukemias, lymphomas and carcinomas of the colon, breast, lung, pancreas, hepatocellular carcinoma, kidney, melanoma, hepatic, lung, breast and prostate cancer, metastatic cancer, and cancers that are or will be treated with radiation, chemotherapeutic, antibody therapy and phototherapeutic agents.

176. The method of claim 175, wherein the renal damage or failure are associated with ischemia, the administration of drugs and radioactive agents, or side effects of adenosine and other anti-arrhythmic agents administered to treat arrhythmias and supraventricular tachycardia (SVT) and to test cardiovascular function.

177. The method of claim 175, wherein the disease is sepsis.

178. The method of claim 174, wherein the composition is administered into the subject's respiratory system.

178 The method of claim 174, wherein the agent is effective to reduce hyper-responsiveness to adenosine, the amount of the adenosine receptor or the production or availability of adenosine, or to increase the degradation of the adenosine receptor mRNA.

179. The method of claim 173, wherein the agent is administered directly into the subject's lung (s).

180. The method of claim 173, wherein the composition comprises solid or liquid particles of the nucleic acid.

181. The method of claim 180, wherein the nucleic acid particles are about 0.5 to about 10 μm in size.

182. The method of claim 180, wherein the nucleic acid particles are about 10 to about 500 μm in size.

183. The method of claim 173, wherein the composition further comprises a surfactant that enhances the uptake of the nucleic acid(s) throughout he lung.

184. The method of claim 174, wherein the disease or condition is associated with bronchoconstriction of lung airways.

185. The method of claim 184, wherein the disease or condition is selected from the group consisting of COPD, asthma, ARDS, side effects of adenosine administration and renal damage.

186. The method of claim 174, wherein the disease or condition is associated

with inflammation.

187. The method of claim 173, wherein the composition further comprises a therapeutic agent selected from the group consisting of adenosine A_1, A_{2b} and A_3 receptor inhibiting agents and adenosine A_{2a} receptor stimulating agents other than the nucleic acid(s), anti-inflammatory agents, anti-bacterial agents, anti-sepsis agents, kidney activity maintenance and restoration agents and agents for the treatment of pulmonary vasoconstriction, inflammation, allergies, asthma, impeded respiration, respiratory distress syndrome (RDS), pain, cystic fibrosis, pulmonary hypertension, pulmonary vasoconstriction, emphysema, chronic obstructive pulmonary disease (COPD), radiation agents, chemotherapeutic agents, antibody therapy agents, phototherapeutic agents, adenosine, anti-arrhythmic agents and cancers selected from hepatocellular carcinoma, leukemias, lymphomas or carcinomas of the colon, breast, lung, pancreas, kidney, melanoma, liver, lung, breast or prostate cancer, or metastatic cancer.

188. The method of claim 187, wherein the therapeutic agent is selected from the group consisting of anti-adenosine A_1, A_{2b} and A_3 receptor agents and adenosine A_{2a} receptor stimulating agents, other than the nucleic acid(s).

189. The method of claim 188, wherein the disease or condition is associated with sepsis.

190. The method of claim 173, wherein the composition is administered intracavitarily, intranasally, intrabucally, by inhalation, or intrapulmonarily.

191. The method of claim 173, wherein the subject is a mammal.

192. The method of claim 191, wherein the mammal is a human.

193. The method of claim 191, wherein the mammal is a non-human mammal.

194. The method of claim 173, wherein the anti-sense nucleic acid is administered in amount of about 0.005 to about 150 mg/kg body weight.

195. The method of claim 194, wherein the anti-sense nucleic acid is administered in an amount of about 0.01 to about 75 mg/kg body weight.

196. The method of claim 195, wherein the nucleic acid is administered in an amount of about 1 to 50 mg/kg body weight.

197. The method of claim 173, which is a prophylactic method.

198. The method of claim 173, which is a therapeutic method.

199. The method of claim 173, wherein the nucleic acid is obtained by

(a) selecting fragments of a target nucleic acid having at least 4 contiguous [nucleic acids] bases selected from the group consisting of G and C;

(b) obtaining a first oligo 4 to 60 nucleotide long which comprises the selected fragment and has a C and G nucleic acid content of up to and including about 15%; and

(c) obtaining a second oligo 4 to 60 nucleotide long comprising a sequence which is anti-sense to the selected fragment, the second oligo having an A base content of up to and including about 15%.

200. The method of claim 173, wherein the oligo consists of up to about 10% A.

201. The method of claim 200, wherein the oligo consists of up to about 5% A.

202. The method of claim 200, wherein the oligo consists of up to about 3% A.

203. The method of claim 202, wherein the oligo is A-free.

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204. The method of claim 173, wherein the oligo is anti-sense to the initiation codon, the coding region or the 5' or 3' intron-exon junctions of a gene encoding an adenosine A1, A2b or A3 receptor and the comp[osition further comprises a surfactant.

205. The method of claim 173, wherein if the oligo contains A at least one A is substituted by a universal base selected from the group consisting of heteroaromatic bases which bind to a thymidine base but have antagonist activity and less than about 0.3 of the adenosine base agonist activity at the adenosine A_1, A_{2b} and A_3 receptors, and heteroaromatic bases which have no activity or have an agonist activity at the adenosine A_{2a} receptor.

B2 Cont.

206. The method of claim 205, wherein all As are substituted by universal bases selected from the group consisting of heteroaromatic bases which bind to a thymidine base but have antagonist activity and less than about 0.3 of the adenosine base agonist activity at the adenosine A_1, A_{2b} and A_3 receptors, and heteroaromatic bases which have no activity or have an agonist activity at the adenosine A_{2a} receptor.

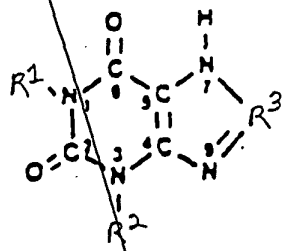
207. The method of claim 205, wherein the heteroaromatic bases are selected from the group consisting of pyrimidines and purines, which may be substituted by O, halo, NH_2, SH, SO, SO_2, SO_3, COOH and branched and fused primary and secondary amino, alkyl, alkenyl, alkynyl, cycloalkyl, heterocycloalkyl, aryl, heteroaryl, alkoxy,

alkenoxy, acyl, cycloacyl, arylacyl, alkynoxy, cycloalkoxy, aroyl, arylthio, arylsulfoxyl, halocycloalkyl, alkylcycloalkyl, alkenylcycloalkyl, alkynylcycloalkyl, haloaryl, alkylaryl, alkenylaryl, alkynylaryl, arylalkyl, arylalkenyl, arylalkynyl, arylcycloalkyl, which may be further substituted by O, halo, NH_2, primary, secondary and tertiary amine, SH, SO, SO_2, SO_3, cycloalkyl, heterocycloalkyl and heteroaryl.

208. The method of claim 207, wherein the pyrimidines and purines are substituted at positions 1, 2, 3, 4, 7 and 8.

SUBC21 cont

209. The method of claim 208, wherein the pyrimidines and purines are selected from the group consisting of theophylline, caffeine, dyphylline, etophylline, acephylline piperazine, bamifylline, enprofylline and xantine having the chemical formula



wherein R^1 and R^2 are independently H, alkyl, alkenyl or alkynyl and R^3 is H, aryl, dicycloalkyl, dicycloalkenyl, dicycloalkynyl, cycloalkyl, cycloalkenyl, cycloalkynyl, O-cycloalkyl, O-cycloalkenyl, O-cycloalkynyl, NH_2-alkylamino-ketoxyalkyloxy-aryl and mono and dialkylaminoalkyl-N-alkylamino-SO_2 aryl.

B2 cont

210. The method of claim 209, wherein the universal base is selected from the group consisting of 3-nitropyrrole-2'-deoxynucleoside, 5-nitro-indole, 2-deoxyribosyl-(5-nitroindole), 2-deoxyribofuranosyl-(5-nitroindole), 2'-deoxyinosine, 2'-deoxynebularine, 6H, 8H-3,4-dihydropyrimido [4,5-c] oxazine-7-one or 2-amino-6-methoxyaminopurine.

211. The method of claim 173, further comprising methylating at least one cytosine into a methylated cytosime (^{m}C) if a CpG dinucleotide if present in the oligo(s).

212. The method of claim 173, further comprising substituting at least one mononucleotide linking phosphodiester residue of or modifying the anti-sense oligo(s) methylphosphonate, phosphotriester, phosphorothioate, phosphorodithioate, boranophosphate, formacetal, thioformacetal, thioether, carbonate, carbamate, sulfate,

sulfonate, sulfamate, sulfonamide, sulfone, sulfite, sulfoxide, sulfide, hydroxylamine, methylene(methyimino), methyleneoxy (methylimino), 2'-O-methyl, phosphoramidate residues, and combinations thereof.

213. The method of claim 212, wherein all phosphodiester residues are substituted and/or modified.

SUB C21 CONT

214. The method of claim 173, further comprising operatively linking the nucleic acid to an agent selected from the group consisting of agents that enhance cell internalization or up-take and cell targeting agents.

215. The method of claim 214, wherein the cell internalization or up-take enhancing agent is selected from the group consisting of transferrin, asialoglycoprotein and streptavidin.

B2 CONT

216. The method of claim 214, wherein the cell targeting agent is a vector.

217. The method of claim 216, wherein the vector to which the agent is operatively linked is a prokaryotic or eukaryotic vector.

218. The method of claim 173, wherein the nucleic acid comprises an oligo sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 and SEQ ID NO:7 to SEQ. ID NO:1035. --.

ADD C22

IN THE ABSTRACT

Please amend the abstract to read as follows.

-- A pharmaceutical composition comprises a surfactant and a nucleic acid comprising an oligonucleotide (oligo) anti-sense to an adenosine A1, A2a, A2b or A3 receptor gene, mRNA, flanking regions or regions bridging the intron/exon borders, low adenosine analogues which bind thymidine but exhibit lower or no adenosine receptor agonist activity. The composition and formulations thereof is effective for preventing and alleviating bronchoconstriction, allergy(ies) and/or inflammation and other conditions associated with breathing difficulties, impeded and obstructed airways, bronchoconstriction, allergy and/or inflammation, such as asthma, kidney damage or failure, acute respiratory distress syndrome (ARDS), inflammation, allergies, impeded respiration, respiratory distress syndrome (RDS), pain, cystic fibrosis, pulmonary hypertension, pulmonary vasoconstriction, emphysema, chronic obstructive pulmonary